

## MOTOR POSITIONING SERVO LOOP USING OVERSAMPLING BITSTREAM DAC

### ABSTRACT OF THE DISCLOSURE

A Hard Disk Drive VCM positioning servo loop comprises an oversampling bitstream Digital to Analog converter. The oversampling DAC is a sigma-delta converter which yields higher resolution and lower noise than Nyquist-rate DACs. This allows driving the VCM with finer level of current control for higher track density. This approach can be implemented in the VCM driver chip ("combo chip") or in the microprocessor device either in hardware or in software, reducing significantly the development and manufacturing cost. Furthermore this approach can be utilized in combination with a VCM actuation method known as "voltage mode drive" wherein the output of the sigma-delta converter represents the voltage to be applied directly to the VCM actuator. Furthermore this approach can be utilized for optical data storage motor positioning servo loops or any other motor positioning servo loops where high dynamic and resolution is needed.